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August 1, 1969.

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19. A CONVENIENT METHOD OF REARING TIGER BEETLES (COLEOPTERA : CICINDELIDAE) IN THE LABORATORY FOR BIOLOGICAL AND BEHAVIOURAL STUDIES

The authors have been making observations on the biology and behaviour of the tiger beetle, *Cicindela cancellata* Dej., and in this connection, the following rearing method was found to be very satisfactory.

A glass specimen jar, 20×20×40 centimetres is used as the rearing jar. It is filled with washed sand which has been sifted through a wire gauze with about 36 meshes per square centimetre, to a height of about thirty centimetres. The sand is kept moist by sprinkling about 100 ml of water twice a week regularly. The jar is preferably placed on a table in an open verandah so that it may be exposed to direct sunlight at least once a day, in the forenoon or in the afternoon. The observations of the authors suggest that a certain amount of strong and direct sunlight is necessary for the normal life and activities of tiger beetles.

The jar is provided with a lid of plastic gauze with about 49 meshes per square centimetre, fixed on a heavy wooden frame. Plastic gauze is preferred to wire gauze which will go rusty in course of time due to sprinkling of water through it. A gauze of fine mesh is selected in order to prevent the escape of small insects which are offered to the beetles and their larvae as food. The gauze-lid also serves the purpose of a ventilator and also prevents excessive humidity and moisture in the sand.

About a dozen adult tiger beetles including both sexes are introduced into each jar. They are offered as food, nymphs of grasshoppers, bits of grasshoppers and leafhoppers collected with a sweep-net over grass. Once in two days, the surface of sand in the jar should be cleaned by removing the remains of dead food-insects and dead beetles. The

beetles seem to thrive well under this arrangement. They soon start mating and laying eggs in the sand.

In course of time, the eggs hatch into larvae and small circular openings of the larval burrows appear on the surface of sand. The highly predaceous larvae catch the leafhoppers and feed on them. They grow and pass through metamorphosis and generation after generation of these beetles can be reared and maintained successfully in this manner. A few of the eggs are laid very close to the walls of the jar and the larvae hatching from them invariably excavate their burrows close to the walls of the jar. Though some of these burrows take their course to the interior of the jar, occasionally, a few of them are excavated directly along the inner surface of the wall which therefore forms part of the inner surface of the burrow itself. In such a case, the interior of the entire burrow from top to bottom can be clearly seen through the transparent glass wall. This situation gives the worker an excellent opportunity to observe the behaviour of the larva inside the burrow, particularly relating to the method of excavation of the burrow, locomotion and feeding. The course and structure of the burrows can also be studied. The behaviour of the adult beetles can also be easily observed through the walls of the jars.

Grateful acknowledgement is made of the grant from the University Grants Commission in support of the studies on the tiger beetles.

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February 17, 1969.

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20. CANNIBALISM IN THE COFFEE BEAN WEEVIL *ARAECERUS FASCICULATUS* DE GEER (COLEOPTERA : ANTHREBIDAE)

Among coleopterous pests of stored products, egg cannibalism has been studied in detail and in relation to population density in the flour beetle, *Tribolium confusum* Duval by Boyce (1946)¹. The coffee bean weevil, *Araecerus fasciculatus* De Geer, which is a serious pest of stored coffee bean, arecanut, tapioca chips, grains etc., also exhibits cannibalistic tendency under certain conditions. The adults have been observed to eat the eggs as well as the adults of their own species in the rearing jars in the laboratory. The factors which prompt a small fraction of the popu-

¹ BOYCE, J. M. (1946) : The influence of fecundity and egg mortality on the population growth of *Tribolium confusum* Duval. *Ecology*, 27 : 290-302.